

# PHYSICOCHEMICAL AND SENSORY PROPERTIES OF THREE DIFFERENT BEEF MUSCLES DURING WET AND DRY AGING

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**Abstract** – The aim of this study was to investigate the effect of different aging methods on physicochemical and sensorial properties of different muscles from Hanwoo beef. Three different muscles [sirloin (*Longissimus lumborum*), butt (*Middle gluteal*), and rump (*Semimembranosus*)] were collected from both sides of 16 carcasses and the half was assigned to control at 2 days postmortem (n=16) and another half was aged with either wet or dry for 28 days (n=8 for each treatment). The chemical composition, shear force, and sensory evaluation of two treatments were analyzed compared with control. In sensory evaluation, butt had significantly higher scores and sirloin had similar scores in tenderness and overall acceptability for dry-aged compared with wet-aged one. Panelists detected that dry-aged rump was tenderer than that of wet-aged one. Overall, it might be more effective when butt and rump are applied for dry-aging method while sirloin would have similar effect on sensory quality regardless of aging method.

**Key Words** –aging effect, muscle characteristic, sensory quality

## I. INTRODUCTION

Aging which can improve tenderness, flavor, and juiciness of beef is divided into wet and dry [1]. In addition, wet aging has positive aspect on salable yield and dry aging can enhance beefy flavor. Previous study reported that physicochemical properties of beef can be affected by different muscles during aging [2]. In terms of this result, different muscles might influence on physicochemical properties of aged beef depending on aging methods. Therefore, the aim of this study was to investigate the effect of wet and dry aging on physicochemical and sensorial properties of different beef muscles from Hanwoo.

## II. MATERIALS AND METHODS

### *Raw materials and dry-aging*

Sirloin (*Longissimus lumborum*), Butt (*Middle gluteal*), and rump (*Semimembranosus*) were collected from both side of total 16 Hanwoo cows (approximately 48-month-old, quality grade 2). The half was assigned to a control at 2 days postmortem (n=16) and another half was aged with either wet or dry aging for 28 days (n=8 for each treatment).

### *Chemical composition and shear force*

Chemical composition and shear force were determined using a FoodScan<sup>TM</sup> meat analyzer (FoodScan<sup>TM</sup> Lab, Foss, Hilleroed, Denmark) and the method of Kim *et al.* [3], respectively.

### *Sensory evaluation*

Each sample (50 × 20 × 6 mm<sup>3</sup>, length × width × height) was grilled until 72°C of core temperature and served to a consumer panel (a total 30 panelists). A 7-point hedonic scale (1, dislike extremely; 7, like extremely) was used to score juiciness, tenderness, flavor, and overall acceptability of beef sample.

### *Statistical analysis*

The GLM was analyzed with the fixed effect (aging method and cut) and the random effect (carcass and side of the carcass). Mean values with standard error of the means were reported and significances were determined with the Student-Newman-Keuls multiple comparison test at a level of  $P < 0.05$ .

### III. RESULTS AND DISCUSSION

#### *Chemical composition and shear force*

Initial fat content of sirloin was higher than butt and rump (control, data not shown). The fat content after aging was similar between butt and sirloin due to relative concentration of fat content by moisture evaporation during dry aging. This phenomenon was slightly higher in butt than sirloin and it was not observed in rump. On the other hand, shear force was significantly decreased in all muscles by both aging methods compared with control (data not shown).

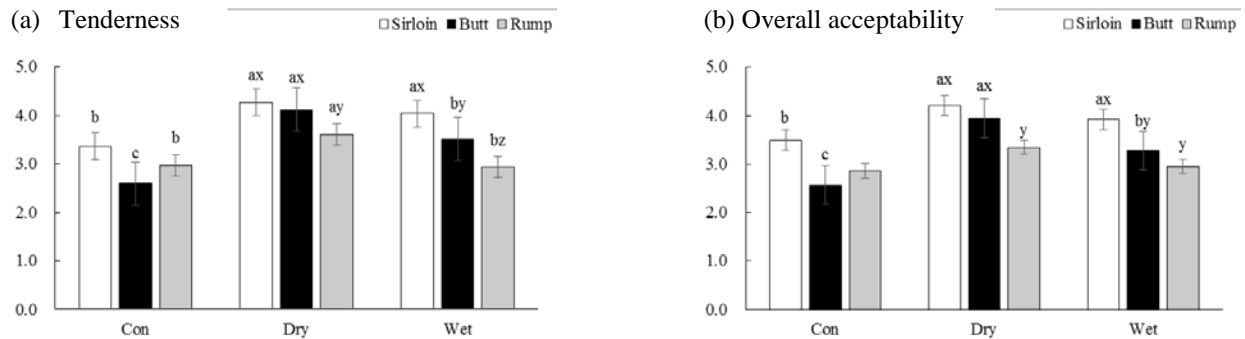


Figure 1. Changes in (a) tenderness and (b) overall acceptability of Hanwoo beef with different aging methods and cuts after 28 days of aging period. <sup>a-c</sup>Different letters within the same cut were significantly different ( $P < 0.05$ ); <sup>x-z</sup> Different letters within the same aging method were significantly different ( $P < 0.05$ ).

#### *Sensory evaluation*

For sirloin and butt, higher tenderness and overall acceptability by aging were observed regardless of aging method compared to control ( $P < 0.05$ , Fig. 1). In tenderness and overall acceptability, sirloin had no difference between the aging methods, while butt had significantly higher score by dry aging than wet-aged one. This may be related to higher fat concentration in butt. In rump, dry aging led to the highest tenderness compared to control and wet-aged one, indicating similar tenderness ( $P < 0.05$ ). This result is probably because of higher juiciness of dry-aged one than wet aging (data not shown).

### IV. CONCLUSION

The application of dry aging in butt and rump led to more positive effect on sensory quality than wet aging, while similar effects were observed in sirloin between aging methods.

### ACKNOWLEDGEMENTS

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